

Assignment # 2.

Due Wednesday, 28 March, in class.

Reading: Sections 1.6, 2.2 of Beardon.

Recall that on problems marked (**G**) for ‘group’ you may cooperate, while on problems marked (**I**) for ‘individual’ you may not cooperate and the only help you may get is from me.

Problems from Beardon:

Section 1.3, page 8 #1 (**G**), 2 (**G**), 4 (**I**).

Section 2.2, page 32 #1 (**I**), 2 (**I**), 4 (**G**).

Note: *Holomorphic* is another word for *analytic*.

Additional problems:

1. (**I**) Show that the map $P(z) = z^2 + c$ is conjugate (on \mathbb{C}) to the map $Q(z) = \lambda z(1 - z)$, and find the precise relationship between c and λ . ($Q(z)$ is the *logistic map*; it maps the interval $[0, 1]$ to itself.)
2. (**G**) **Optional:** Use a program (for example, you can write your own, or find one in the book *The Beauty of Fractals* on reserve in the library) to make some computer sketches of Julia sets of $P(z) = z^2 + c$. Try $c = 0.2$, -0.8 , -1.3 , and $7/4$. Beautiful sets should appear for $c = -0.9 + 0.12i$, and $-0.74543 + 0.11301i$. The Julia sets corresponding to $c = 0.27334 + 0.00342i$ and $-0.48176 - 0.53165i$ are difficult for certain algorithms to obtain. Experiment. Turn in your sketches.